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Affordable High Speed Internet for America

A project of Communications Workers of America



2009

A Report on Internet Speeds in All 50 States

www.speedmatters.org



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U.S Internet Speeds in 2009 Show Limited Progress and Still Lag Behind Many Countries

The results of this third annual speedmatters.org survey of Internet speeds show that the U.S. has not made significant improvement in the speeds at which residents connect to the Internet. Our nation continues to fall far behind other countries.¹

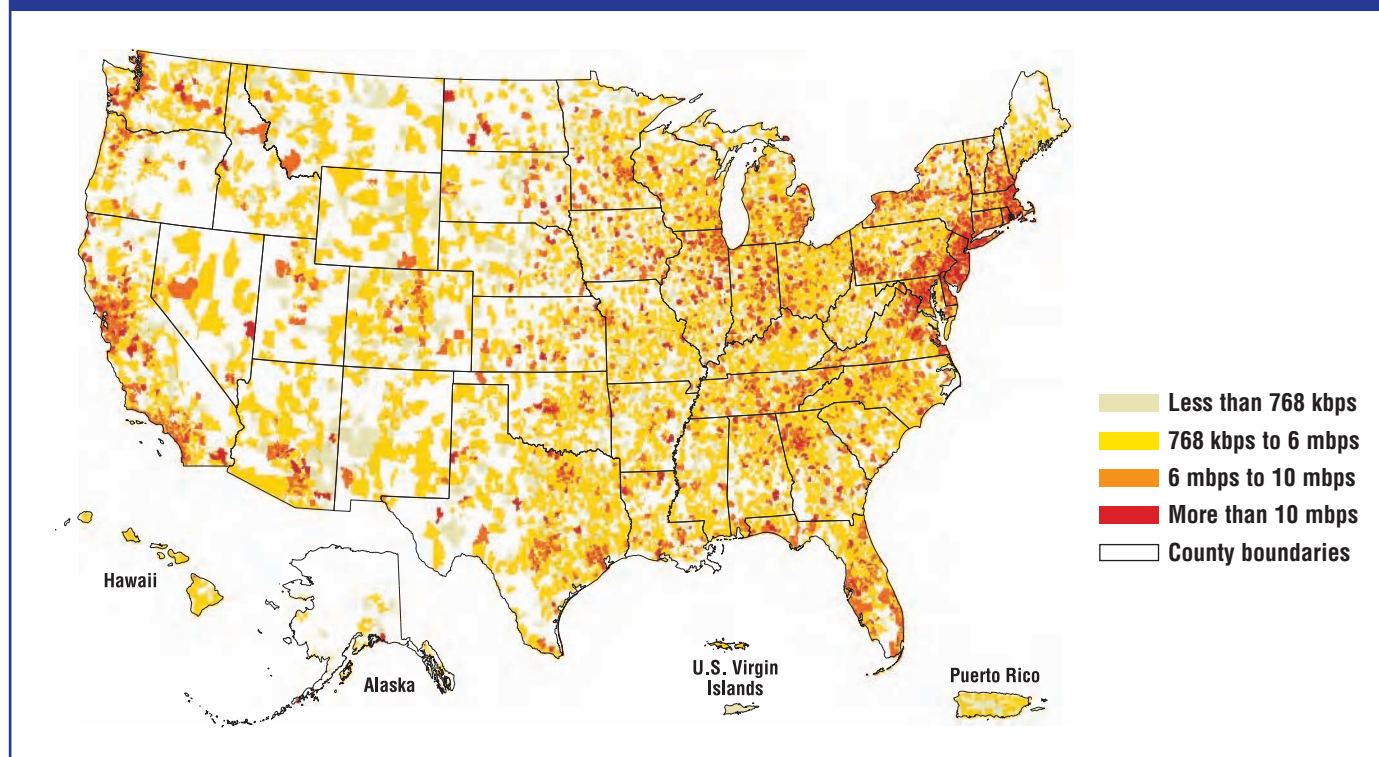
Speed makes the promise of the Internet a reality. But too many Americans are locked into slow Internet, foreclosing access to many online applications and services.

The 2009 speedmatters.org survey finds that the average download speed for the nation was 5.1 megabits per second (mbps) and the average upload speed was 1.1 mbps. These speeds are just slightly faster than the 2008 speedmatters.org results of 4.2 megabits per second (mbps) download and 873 kilobits per second (kbps) upload. In other words, between 2008 and 2009, the average download

speed increased by only nine-tenths of a megabit per second (from 4.2 mbps to 5.1 mbps), and the average upload speed barely changed (from 873 kbps to 1.1 mbps). At this rate, it will take the United States 15 years to catch up with current Internet speeds in South Korea. Moreover, the average upload speed from the speedmatters.org survey is far too slow for patient monitoring or to transmit large files such as medical records.²

The 2009 speedmatters.org survey also reveals that the U.S. continues to lag far behind other countries. The United States ranks 28th in the world in average Internet connection speeds. In South Korea, the average download speed is 20.4 mbps, or four times faster than the U.S. The U.S. trails Japan at 15.8 mbps, Sweden at 12.8 mbps, the Netherlands at 11.0 mbps, and 24 other countries that have faster broadband than we do.

U.S. Internet Speeds in All 50 States



Most Americans Locked into Slow Internet

Downstream speed	Percent of Speed Testers
< 768 kbps	18%
768 kbps to 6 mbps	51%
6 mbps to 10 mbps	13%
10 mbps to 25 mbps	17%
> 25 mbps	2%

Source: speedmatters.org 2009 speed test results. Results do not add up to 100% due to rounding. The Federal Communications Commission defines basic broadband as speeds greater than 768 kbps in one direction.

Moreover, people in other countries have access to much faster networks. Ninety percent of Japanese households have access to fiber-to-the-home networks capable of 100 mbps. According to the Organisation for Economic Cooperation and Development (OECD), the average of advertised speeds offered by broadband providers in Japan was 92.8 mbps and in South Korea was 80.8 mbps download. According to the OECD, the U.S. ranks 19th in the world in average advertised broadband download speed at 9.6 mbps.³

The results of the 2009 speedmatters.org survey also show that most Americans continue to be locked into slow Internet, while relatively few have access to truly high-speed two-way connections. Eighteen percent of those who took the speed test recorded download speeds that were slower than 768 kbps, which does not even qualify as basic broadband according to the Federal Communications Commission. Another two-thirds (64 percent) of speed test participants connected at less than 10 mbps downstream, which is not enough bandwidth for high-definition video. Only one-fifth (19 percent) of speed test participants connected at speeds greater than 10 mbps, with only 2 percent of those exceeding 25 mbps downstream.⁴

Speed makes all the difference on the Internet. Current generation broadband, usually a DSL or cable modem connection, typically delivers from 768 kbps to 6 mbps downstream and less than 1 mbps upstream. These rates provide enough capacity to send and receive e-mail, browse web sites, or watch a 10-minute You-Tube video. But these speeds are not enough to handle high-definition video streaming.

Next-generation broadband provides enough bandwidth to allow people to send and receive multiple video channels, large data files, medical diagnostics, or participate in real-time video conferencing. These activities require at least 10 mbps download and upload speed. Fiber-to-the-home networks can deliver 100 mbps in both directions.

Using the typical speeds available on today's DSL or cable modem, it can take two hours or more to upload or download an educational video, but only two minutes on an all-fiber network.

Similarly, at U.S. average download and upload speeds, it takes about 35 minutes to download 100 pictures taken on a family vacation and a full four hours to upload those same photos. On an all-fiber 100 mbps network, it would take less than two minutes to upload or download the full set of pictures.

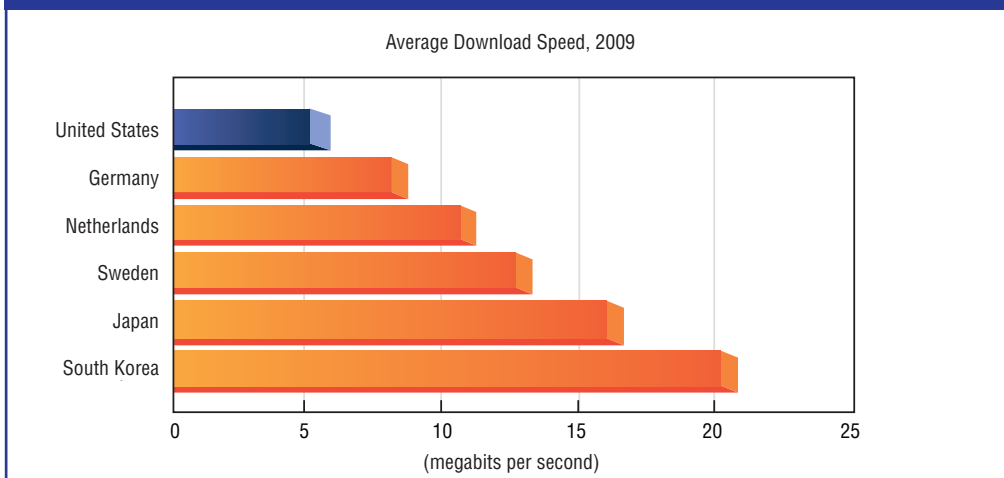
Why Speed Matters

U.S. Economic Growth Depends on High-Speed

Internet. We need high-speed Internet for our homes, schools, hospitals, and workplaces. Speed defines what is possible on the Internet. It determines whether we will have the 21st century networks we need to create the jobs of the future, develop our economy, and support innovations in telemedicine, education, public safety, energy conservation, and public services to improve our lives and communities. Most U.S. Internet connections today are not fast enough *in both directions* to permit interactive home-based medical monitoring, multi-media distance learning, or to send and receive data to run a home-based business.

U.S. Trails Far Behind Other Countries. The United States has fallen to 15th behind other industrialized nations in the percent of the population subscribing to broadband. Countries like Canada, Britain, France, Germany, and Sweden have higher broadband subscription rates than we do.⁵ In addition, other countries, like Japan, South Korea, and Sweden, have much faster Internet connections than we do. People in Japan can upload a high-definition video in 12 minutes, compared to a grueling 2.5 hours at the U.S. average upload speed. Yet, people in Japan pay about the same as we do in the U.S. for their Internet connection.⁶

U.S. Internet is Behind the Rest of the World



Sources: U.S. data is from speedmatters.org test results. International data from speedtest.net.

Millions of Americans Don't Have High-Speed Internet.

All too many Americans encounter a significant digital divide. Families in rural areas are much less likely to subscribe to broadband. According to surveys, while 67 percent of urban households and suburban households subscribe to broadband, only 46 percent of rural households do. Similarly, whereas 88 percent of Americans who earn over \$100,000 a year get broadband, only 35 percent of households that earn less than \$20,000 subscribe. Only about one-half (54 percent) of middle-income families earning between \$30,000 and \$40,000 a year subscribe to broadband.⁷

A National Broadband Plan to Achieve Universal, Affordable, High Speed Internet

The United States is the only industrialized nation without a national policy to promote high-speed broadband. Fortunately, this is about to change. In the American Recovery and Reinvestment Act of 2009 (the economic stimulus bill), Congress instructed the Federal Communications Commission (FCC) to develop a national broadband plan by February 2009. The FCC is hard at work on that plan.

Congress also included \$7.2 billion in the economic stimulus legislation for competitive grants to accelerate broadband deployment and adoption, including up to \$350 million for state broadband mapping efforts. In this land-

mark legislation, Congress recognized that broadband is an essential infrastructure for global competitiveness, job creation, and improvements in education, health care, public safety, energy conservation, among other purposes. The stimulus funds are merely a down payment, and much more must be done.

There are a number of bold but specific steps that the U.S. should take to recover our lost leadership and competitive position to ensure that all residents benefit from affordable, high-speed Internet access.

- 1. ESTABLISH A NATIONAL POLICY GOAL.** A reasonable initial goal would be to construct an infrastructure with enough capacity for 10 megabits per second (mbps) downstream and 1 mbps upstream by 2010. New benchmarks in succeeding years should expand the number of households capable of sending and receiving multiple channel high-definition video and reach the global standard of 100 mbps.
- 2. COLLECT ROBUST AND DETAILED BROADBAND DATA.** Good data is essential to craft good policy. To date we have been hampered by inadequate information about broadband deployment, adoption, speed, and prices. Fortunately, the situation is about to change. The Federal Communications Commission (FCC) has improved its broadband data collection program, federal funds are available to states to map their broadband infrastructure, and a congressionally-mandated national broadband map must be completed by spring 2011.

3. DEVELOP STATE AND REGIONAL BROADBAND PLANNING COMMISSIONS OR TASK FORCES AND PUBLIC-PRIVATE PARTNERSHIPS TO STIMULATE HIGH-SPEED BROADBAND DEPLOYMENT AND ADOPTION.

A number of states have created broadband task forces, commissions, or authorities that bring together multiple public and private stakeholders to develop cost-effective state broadband plans. State and regional planning is essential to create an accurate assessment, conduct analyses of barriers to broader deployment and adoption, target public resources and create public-private partnerships to overcome these barriers, and share models of successful initiatives. Programs such as Connect Ohio and Connect Tennessee demonstrate that research-based planning, demand stimulation, and public-private partnerships increase deployment and adoption of broadband.⁸

4. REFORM UNIVERSAL SERVICE. Today, universal service subsidies support voice telephony. It is long past time to reform our universal service program to support affordable, high-speed Internet for all. The \$7.2 billion stimulus funding provides an important laboratory to determine the most effective use of grants and low-interest loans to fund network deployment in high-cost rural areas and other underserved areas, and the extent to which we will need on-going operating subsidies to ensure affordability. The existing universal service Lifeline and Link-Up programs of subsidies to low-income families for telephone service should be expanded to include subsidy programs for Internet access and equipment, such as computers. The highly-successful E-Rate program of subsidies to schools, libraries, and rural health centers should continue and support the expanded bandwidth needs of these community institutions.

5. TAX INCENTIVES FOR FASTER SPEEDS. Upgrading today's broadband to next-generation high-speed networks will require tens of billions of dollars of capital investment, largely from the private sector. Tax incentives lower the cost of capital, enabling the private sector to accelerate and expand investment in high-speed broadband technologies. This is how Japan and South Korea achieved world leadership in broadband, building nearly universal fiber-to-the-home networks capable of delivering 100 mbps.

6. USE BROADBAND TO ADDRESS OUR NATION'S CHALLENGES. Broadband-enabled smart grids and smart meters can cut energy consumption. Online two-way video allows

doctors to make virtual "house calls" and diagnose medical conditions at a distance. High-speed connections enable students to take courses hundreds of miles away, yet participate in class discussion, or complete job certification online. Better and faster data transmission permits fire, police, and emergency personnel to exchange real-time video and data. Federal, state, and local policy makers should integrate broadband infrastructure and applications into delivery of education, health, job training, public safety, and other public services.

7. NO CHILD OFFLINE. One-third of adults in the U.S. do not use the Internet, and most of them do not own a personal computer. Surveys indicate that the biggest barriers to broadband adoption are lack of computer, high cost of equipment and broadband access, lack of knowledge about how to use the technology, and lack of interest in existing broadband applications.⁹ The federal broadband stimulus grants should provide important models to expand digital literacy, develop public-interest broadband applications and services, and provide affordable computers and broadband access equipment to low-income households.

8. PRESERVE AN OPEN INTERNET. We must protect free speech on the Internet so that people can go where they want and download or upload what they want when they want on the Internet. There should be no unreasonable blocking of access to any websites, degradation of service, or censoring any lawful content on the Internet. The FCC should adjudicate on an expedited basis complaints alleging unreasonable discrimination by broadband or content providers, while recognizing the need for reasonable network management. Most important, building high-capacity networks will ensure that all Americans have fast, open access to all content on the Internet.

9. SAFEGUARD CONSUMERS AND WORKERS. Public policies should support the growth of good, career jobs as a key to providing quality service. Government should require public reporting of deployment, actual speed, price, and customer service benchmarks.

It is long past time to restore U.S. leadership in high-speed Internet policy. The U.S. has a lot of ground to cover just to remain competitive with other economies that have already adopted policies that facilitate job growth, business advancement, and individual achievement through access to the latest information technologies. Policymakers must act now to ensure that every American gains access to the benefits of the information age.

Speed Matters on the Internet

Speed Ranges Needed for Various Online Applications

Upstream and Downstream Speed Range	Applications	Upstream and Downstream Speed Range	Applications
500 kbps – 1 mbps	Voice over Internet Protocol telephony Basic email Web browsing (simple sites) Streaming music Low quality video (highly compressed)	5 mbps – 10 mbps	File sharing (large) IPTV-Standard Definition (multiple channels) Broadcast Standard Definition video Video streaming (2-3 channels) High Definition video downloading Medical file sharing (basic) Remote diagnosis (basic) Remote education Building control and management
1 mbps – 5 mbps	Web browsing (complex sites) Email (larger size attachments) Remote surveillance IPTV-Standard Definition (SD) (1-3 channels) File sharing (small/medium) Digital broadcast video (1 channel) Streaming music	10 mbps – 100 mbps	Telemedicine Educational services Broadcast video SD and some High Definition IPTV-High Definition High quality telepresence High Definition surveillance Smart/intelligent building control

Source: California Broadband Task Force, The State of Connectivity: Building Innovation Through Broadband, Jan. 2008 (available at www.calink.ca.gov/pdf/CBTF_FINAL_Report.pdf)

Endnotes

- Between May 2008 and May 2009, 413,000 people in all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands went to the speedmatters.org site to take an Internet speed test and measure how fast their computers can upload and download data.
- There are several statistical methodologies to calculate the center of a distribution of numbers. In this 2009 report, we calculate the *mean* or average Internet upload and download speeds (e.g. the sum of all speed tests divided by the number of test takers). In previous speedmatters.org reports (2007 and 2008), we calculated the *median* Internet upload and download speeds. The *median* represents the middle value of a set of numbers (e.g. half the numbers in a series are larger than the median and half are smaller). Since other commercial speed tests that provide international data report the mean (average), we have decided to use the *mean* (average) in this 2009 report. For comparison purposes, we have re-calculated the 2008 data to show the mean (average) speeds. The U.S. data is from speedmatters.org test results. The international data is from speedtest.net.
- There is a difference between actual and advertised Internet speeds. The speedmatters.org speed test and the international data collected by speedtest.net measure the *actual* speed of an Internet connection. The OECD data reports the average of *advertised* speeds offered by broadband providers in its 30 member countries. The OECD data is useful in showing the typical speed available to households. Organisation for Economic Cooperation and Development, OECD Broadband Statistics, Table 5a. (available at www.oecd.org/document/54/0,3343,en_2649_34225_38690102_1_1_1_1,00.html). See also Information Technology and Innovation Foundation, *Explaining International Broadband Leadership*, May 2008 (available at www.itif.org/files/ExplainingBBLeadership.pdf).
- Our results are consistent with other publicly available data. The Pew Internet and American Life Project reports that seven percent of Internet users have a dial-up connection. See Pew Internet & American Life Project, “Home Broadband Adoption 2009” (available at www.pewinternet.org/~media/Files/Reports/2009/Home-Broadband-Adoption-2009.pdf). The FCC reports on the speed of broadband infrastructure based on data supplied by broadband providers. According to 2008 FCC data, six percent of wired broadband lines are capable of delivering data at speeds below 200 kbps; 26 percent of lines can deliver data at speeds between 200 kbps and 2.5 mbps; 60 percent of lines can deliver data at speeds between 2.5 mbps and 10 mbps; eight percent of lines can deliver data at speeds between 10 mbps and 25 mbps; and fewer than one percent of lines can deliver data at speeds that exceed 25 mbps downstream. CWA calculations based on FCC, “High Speed Services for Internet Access: Status as of June 30, 2008,” Table 5. 2009.

- 5 Organization for Economic Cooperation and Development. The OECD surveys are available at www.oecd.org/document/54/0,3343,en_2649_34225_38690102_1_1_1_1,00.html) The United States ranked 20th in broadband penetration among all countries, according to the International Telecommunications Union, World Telecommunications Database 2008 (available at www.itu.int/ITU-D/icteye/Reporting/ShowReportFrame.aspx?ReportName=/WTI/InformationTechnologyPublic&RP_intYear=2008&RP_intLanguageID=1).
- 6 Robert D. Atkinson, Daniel K. Correa, Julie K. Hedlund, Explaining International Broadband Leadership, Washington, D.C.: The Information Technology and Innovation Foundation, May 2008 (available at <http://www.itif.org/files/ExplainingBBLeadership.pdf>); Derek S. Turner, "Broadband Reality Check", Aug. 2006 (available at <http://www.freepress.net/docs/bbrc2-final.pdf>); CWA, "Speed Matters: Affordable, High Speed Internet for All, 2006 (available at <http://files.cwa-union.org/speedmatters/SpeedMattersCWAPositionPaper.pdf>).
- 7 Pew Internet & American Life Project, "Home Broadband Adoption 2009." (available at <http://www.pewinternet.org/~media/Files/Reports/2009/Home-Broadband-Adoption-2009.pdf>).
- 8 For more information on state initiatives, see Communications Workers of America and Alliance for Public Technology, "State Broadband Initiatives" available at <http://www.speedmatters.org/content/statepolicy/>.
- 9 Pew Internet and American Life, "Reasons People Do Not Have Broadband at Home," Jan. 2009 (available at www.pewinternet.org/Infographics/Reasons-people-do-not-have-home-broadband.aspx).



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